



SPORT, TIME AND INNOVATION

REI2 is a professional stopwatch of innovative conception that makes it possible to satisfy all timing requirements in the various sport disciplines.

The large graphic display that guides the user step by step in the management of the competition and the keyboard, designed so as to maximize efficiency and speed in data input and correction, provide a simple and immediate user-friendly interface.

The wide range of software programs available and the possibility of connection to the LinkGate radio transmission system ensure that **REI2** is very flexible to use.



POWERFUL AND DIRECT

REI2 can acquire data from a computer and store the athletes' names and start list. It is therefore possible to display competitors' names on the stopwatch display and the displayboards without using a computer on the competition field.

Thanks to powerful software, **REI2** makes it possible to manage the display of results on the displayboards with great flexibility according to the type of competition and the displayboard available.



01 Thermal printer, functioning temperature $-20 + 70^{\circ}\text{C}$, printing speed of up to 8 lines a second

02 Large size (mm 132x39) backlit graphic display, functioning temperature $-20 + 70^{\circ}\text{C}$

03 Function keys to access the options on the screen

04 Key for modifying start data/finish data

05 Start/stop/lap/aux and manual line activation key

06 Line configuration key (management of blocking and timing of lines)

07 Extra functions key

08 Backlighting activation key

09 Arrow keys for rapid selection

10 Displayboard activation/disactivation key

RELIABLE AND VERSATILE

Keyboard

The presence of 5 function keys and of other dedicated keys (displayboard management, line disablement, etc.) ensures that the machine's functions can be accessed with maximum speed. The user-friendly layout of the keys (spacing and positioning) and good touch sensitivity allow fast keying in.

Display

Large size (132 x 39mm) LCD graphics with user-activated backlighting and contrast regulation. The graphics mode is a useful innovation that makes it possible to highlight the most important information by using different-size characters where necessary, and to organize information in a more rational way.

Printer

New-concept thermal printer that can function even at low temperatures (-20 + 70°C), with a printing speed of up to 8 lines a second and completely noiseless during use.

Ingressi linee

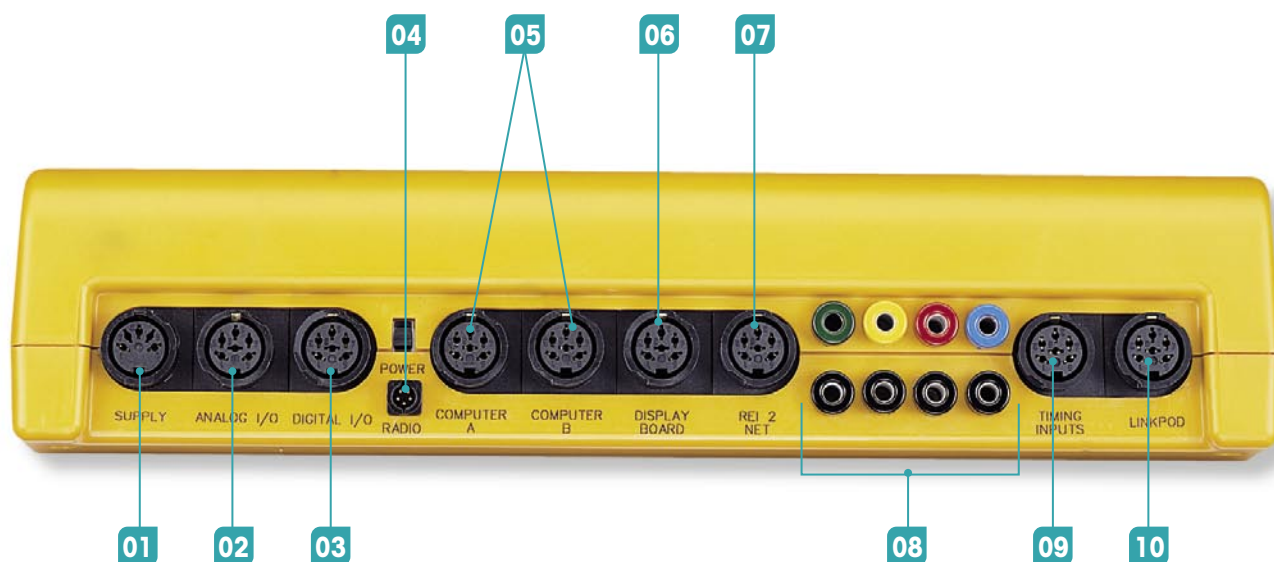
REI2 has 4 main input lines (start, stop, lap, aux) and an extra configurable input (timing input) available for immediate use at the back of the device and 4 keys for manual line activation.

LinkPod line expansion system

As well as the inputs on the device available for immediate use, **REI2** can take up to a maximum of 80 more external lines through the LINKPOD system.

It is possible to connect up to a maximum of 10 LinkPods (8 lines per LinkPod) with a cable available in different lengths.

The external lines are galvanically insulated from the stopwatch power supply (in compliance with swimming-race regulations). The expansion pods can be placed a long distance away (several hundred metres). It is also possible to disable the lines and to modify disactivation times individually. The logical channel of each line can be re-assigned with the software.



01 External and recharge power supply socket

02 Analogue inputs (temperature, humidity...)

03 Digital inputs/outputs for control of accessories

04 Connection for reception of signals via radio

05 Two fast RS232 serials for connection of computer

06 RS 232/48 serial for connection of displayboards

07 Connection to **REI2** NET network

08 Start/Stop/Lap aux inputs

09 Timing impulse input with power supply to external sensor

10 Connection to LinkPod expansion lines

PRACTICAL AND PRECISE

Transmission of impulses via radio

REI2 can be used in combination with the LinkGate radio transmission system. As well as start and finish times, it is possible to radiotransmit 14 intermediate times, each differently identified, or to acquire up to 16 passing speeds from as many timing zones.

Memory capacity

REI2 can permanently store about 100,000 events (naturally memory is maintained also when the device is switched off).

Transfer from PC to REI2 of athletes' names and the start list

In addition to normal transmission of stored data from the stopwatch to PC, it is also possible to transfer athletes' names and the start lists from PC to **REI2**. The competitors' names can then appear on the Microgate graphic alphanumeric displayboards, as well as on the stopwatch printout, thus avoiding the use of the computer on the competition field.

'Multirace' management

A number of timing sessions (up to a maximum of 8) can be stored and called up as required, also with different function modes (for example, single starts, group starts and parallel slalom).

Real-time rankings

When the competitor finishes, his/her provisional position in the rankings is immediately shown on the display and displayboards.

Software updating

By connecting directly to Microgate's Internet site, the user can install new programs or update those already installed in the device.

Time base

The time base used on **REI2** is temperature-compensated and guarantees a high level of accuracy: \pm ppm equal to about ± 0.08 s/day throughout the temperature range (-20°C to $+70^{\circ}\text{C}$). The time base continues to function accurately even when the device is switched off (until the batteries have run down completely), maintaining synchronization of date and time.

Autonomy and battery recharge

REI2 is fitted with high-capacity Ni-MH batteries that guarantee about 20 hours of continuous use. Recharging is entirely managed in a 'smart' way (discharging + recharging) to guarantee maximum reliability. Continuous current power supply is also possible, with an input of 10 to 30V.

Communication to PC

The stopwatch has 2 completely independent high-velocity bi-directional lines (which can be set at 1200 to 115200 bit/s). The two lines are dedicated to communication with the Personal Computer (race software management, television graphics, etc.)

Displayboard management

The displayboards are commanded through a dedicated serial line. Interfacing with displayboards of other constructors is also possible, but naturally the various display options can be exploited better with the Microgate MicroTab and MicroGraph displayboards.

REI2 NET

The way **REI2** is structured offers the possibility of connecting together up to 8 machines for distributed timing management.

The special features of **REI2** Net management are as follows:

- Synchronization takes place on only one machine and from that moment on the networked **REI2s** are kept constantly synchronized with each other, as they can be integrated on a single time base
- The various timing impulses can be received by all the networked machines. Consequently the number of inputs and outputs are multiplied by the number of networked machines. The extra machines are not only auxiliary keyboards!
- The whole database of times is duplicated on every machine. Every **REI2** is a backup machine for the others.
- Addition of a **REI2** to a pre-existing **REI2** NET network involves automatic synchronization of both the time base and the database with the machines that are taking times.
- The possibility of assigning to a **REI2** the management of a single timing impulse (for example, an intermediate time) without the risk of interfering with the management of starts and finishes.
- Connection between **REI2s** is made with a very simple six-pole cable.

Use of GSM

Possibility of setting a GSM connection between two or more **REI2** stopwatches for the transmission of timing impulses and information also over long distances.

Operating temperature

Functioning of the device is guaranteed for temperatures ranging from -20°C to $+70^{\circ}\text{C}$.





PROGRAMS AVAILABLE

Simple stopwatch:

- management of light athletics races, optimal for display of lap times and speeds
- countdown management
- cycling
- carving competition management
- motor races
- possibility of stopping/restarting time with display on the displayboards (basketball, time out)

Single starts:

- races such as Alpine skiing, downhill mountain bike, hill climb trials, etc.
- possibility of managing an unlimited number of competitors on the course
- use of BIBO regulation for start list inversion
- materials testing: for the measurement of average and point speeds, for the acquisition of temperature and humidity of the air and snow temperature. Suitable also for acquiring anemometric data

Group starts:

- specially recommended for the management of races such as Nordic skiing, marathon, cross-country running, cycling, etc.

Parallel:

- possibility of managing races without a start impulse (only finish times different), with single start (start barriers)

Show jumping:

- timing of single-phase or double-phase races in conformity with international federation tables (homologated FEI)
- simple and immediate assignment of point and time penalties
- barrage
- points race
- sophisticated rankings management

Swimming:

- race management performed manually or using touch pads
- possibility of automatically acquiring the lane the impulse comes from
- automatic recognition of intermediate time or finish impulses based on the setting for the length of the pool and the possibility of excluding one or more lanes if not used

Track pursuit:

- for skating races (also quartets and multi-lane)
- for cycling races

PC on-line program:

- old timer races: management of one or more timing points (using pressure or other sensor) with association of bib with the impulse taken
- use of the stopwatch as time base for remote management using PC

Horse racing:

- Horse race management with remote or manual photocell management for intermediate times using the MicroMux system

All the programs are completely configurable for adjustment to any kind of competition.



REI2 - TECHNICAL DATA

Weight	1.9 kg, including batteries
Dimensions	187 x 286 x 64 mm
Time measurement unit	selectable: 1 s – 1/10 s – 1/100 s – 1/1000 s • Speed: selectable m/s – km/h – mph – knots
Resolution measurement	4 x 10 ⁻⁵ s (1/25000 s)
Display	Graphic display, display area 132x 9mm 240x64 pixels, with software regulation of contrast and backlight
Time base	12.8MHz oscillator, stability ±ppm between –20°C and +70°C
Precision	±0.0864 s/day for external temperatures between –25°C and 70°C
Operating temperature	–20°C / +70°C
Power supply	Internal NiMh batteries; c.c. 10-30V external power supply
Battery recharge	Built-in 'smart' recharger (automatic discharging/recharging, double control of charging)
Autonomy	>20 hours at an average print rate of 1 time every 20 seconds The chronometer also maintains synchronization with the accuracy of the time base when the device is switched off until the batteries are run down. (starting with a situation of batteries half-charged relative to maximum, synchronization is maintained for more than 25 days)
Microprocessor	Three 8- and 16-bit C-MOS microprocessors
Printer	Thermal printer • Various font types available • Speed: about 7 lines/s • Works with normal paper
Keyboard	32-key keyboard with waterproof film cover • Start-Stop-Lap-Aux keys • Numerical keyboard • 5 function keys • 2 arrows for scrolling times • 2 keys for disabling inputs and 2 for blocking and timing of lines (stop line plus one configurable line) • key for enabling/disabling/cancelling displayboard • key for selection of start/finish corrections • key for winding paper forward • display backlight key
Memory	Approx. 100,000 time events • Retention of stored data when device is switched off
Connections	Connections on 6-pole amphenol socket: • Start, stop, lap and auxiliary signal inputs (on both Ø 4 mm jack plugs and on the amphenol socket) • Connection to LinkPod system (max 80 auxiliary inputs totally insulated from stopwatch power supply) • REI2 NET connection for communication with other REI2 stopwatches • +5V output stabilized for powering external devices • RS 232/485 serial input/output for connection to displayboards • 2 high-velocity RS 232/485 serial inputs/outputs (up to 115.2 Kbaud) for connection to PC • Analogue inputs for connection of sensors for air temperature and humidity and snow temperature • Digital inputs/outputs for connection/command of external devices (e.g. MicroSem Starting Light) • 5-pole socket for connection to LinkGate radio transmission system (up to a maximum of 16 different signals) • Input for external power source and/or battery recharge